

during the summer of 1881, has returned to Chicago, and has recommenced his valuable measures of double stars with the large refractor. The present report has an engraving of this instrument, and of the tower of the Dearborn Observatory, in which it is mounted.

COMET 1882 *b* (FINLAY, SEPTEMBER 8).—The following positions of this comet are deduced from the elements published in NATURE last week:—

At 18h. Greenwich M.T.									
R.A.			Decl.			Log. distance from			
h. m. s.						Earth.		Sun.	
Oct. 19	10	13 22	...	15	7' 3	...	0'1592	...	0'0466
21	10	10 39	...	15	54' 2	...	0'1613	...	0'0640
23	10	7 53	...	16	40' 4	...	0'1633	...	0'0804
25	10	5 3	...	17	26' 0	...	0'1651	...	0'0959
27	10	2 8	...	18	11' 0	...	0'1666	...	0'1106
29	9	59 7	...	18	55' 5	...	0'1679	...	0'1247
31	9	55 59	...	19	39' 6	...	0'1690	...	0'1382

### CHEMICAL NOTES

MM. HAUTEFEUILLE and CHAPPUIS have obtained what appears to be pure liquid ozone, by compressing a mixture of oxygen and ozone at 125 atmospheres, and cooling the end of the capillary tube by a jet of liquid ethylene: on suddenly releasing the pressure, a drop of a very deep indigo-blue liquid remained in the end of the tube. The gas above this liquid was colourless, but as the last traces of liquid evaporated, the gas was seen to have a blue colour (*Compt. rend.* xciv. 1249).

It is well known that sulphuretted hydrogen produces little or no precipitate in an aqueous solution of arsenious oxide: according to the experiments of Messrs. H. Schulze (*Journal für pract. Chemie*, 2, xxv. 431), such a liquid contains a colloidal form of arsenious sulphide. This colloid may be completely separated from dissolved arsenious oxide by prolonged dialysis; the solution, if dilute, is scarcely changed by long-continued boiling; the presence of free acids or of such soluble salts as chloride of potassium, iron, or chromium induces a change of the colloidal into an insoluble form of arsenious sulphide.

By strongly compressing phosphoretted hydrogen in presence of water, and then suddenly decreasing the pressure, M. Cailletet has obtained a crystalline hydrate of this compound, the existence of which is conditioned by the temperature and pressure; the critical point, *i.e.* the temperature above which the substance cannot exist, whatever be the pressure, is 28°. Hydrates of sulphuretted hydrogen and of ammonia have also been obtained by this method (*Compt. rend.*, xciv. 58).

By a somewhat similar process, M. Wroblewski has obtained a solid crystalline hydrate of carbon dioxide,  $\text{CO}_2 \cdot 8\text{H}_2\text{O}$ : the experimental results of this author seem to show that at the pressure required to cause the absorption of carbon dioxide by water in the proportion indicated by the formula  $\text{CO}_2 \cdot \text{H}_2\text{O}$ , the water would be entirely frozen, and therefore that this hydrate cannot be obtained by this method (*Compt. rend.*, xciv, 1355).

"WHEN solution of two salts, capable of mutual action, are mixed, the solution contains four salts": it has hitherto been difficult to give a direct experimental proof of this generalisation made half a century ago by Berthelot. In the last number of the *Berichte* of the German Chemical Society (15, 1840) Herr Brügelmann describes the following experiments designed to prove the justness of Berthelot's statement:—Equal volumes of cold saturated solutions of cobalt chloride and nickel sulphate are mixed and allowed to deposit crystals by evaporation at ordinary temperatures; the crystals contain cobalt and nickel, but combined with sulphuric acid only. A mixture of solution of cobalt chloride and copper sulphate, prepared similarly to the preceding, deposits sulphate of the two metals almost free from chlorides. Copper sulphate and potassium dichromate solutions when mixed deposit crystals consisting almost entirely of sulphates of copper and potassium, the second crop of crystals contain a little chromate of the two metals, and the final crop is nearly free from sulphates.

THE "Compagnie Generale des Cyanures et Produits Chimiques" of Paris have issued a small pamphlet explanatory of the various technical applications of the salts known as sulphocyanates, which can be now readily manufactured in a state of purity. Sulphocyanate of aluminium is used as a mordant in

alizarine dyeing; sulphocyanate of copper in the preparation of aniline black, and also, along with potassium chlorate and antimony sulphide, in the preparation of matches; sulphocyanate of potassium may be employed as a refrigerating material, as during the solution of 130 parts of this salt in 100 parts of water, temperature is lowered through 34°; sulphocyanate of ammonium is more effectual, weight for weight, as an antichlor, than hypsulphite of soda.

INVESTIGATIONS conducted at the Baden Aniline and Soda Works show that the change of orthonitrophenyl propiolic acid into indigo, which (as already explained in this journal) has been for the most part effected by grapes or with sugar, can also be produced by the agency of sulphides, sulphhydrates, polysulphides, thiocarbonates, and especially the alkaline xanthates (*Chemisches Centralblatt*, 1882, 366).

### GEOGRAPHICAL NOTES

NEWS has been received from the expedition of Dr. Emil Riebeck, dated July 7 last. It will be remembered that Dr. Riebeck, together with Dr. Schweinfurth made a thorough investigation of the island of Socotra, which was of high scientific importance. After this task was accomplished, the travellers separated, and Dr. Riebeck crossed to Bombay, travelled through large tracts of the Himalaya Mountains, remained for some time in Cashmere, then passed through the Ganges land, investigated Ceylon, and eventually undertook a special and detailed examination of the coast district of Aracan. He ascended the Karnasuli River from Tschittagong as far as the Hill tribes, to which Prof. Bastian has drawn special attention. He made many measurements, took numerous photographs and plaster casts of this highly interesting tribe, which is still living in a most primitive natural state. The climate, however, and particularly the frequent fording of rivers, soon told upon Dr. Riebeck's health. He contracted a fever, and had to be taken to Singapore. His valuable collections of zoological, anthropological, and ethnological specimens duly attracted the attention of geographers, and were frequently referred to at the recent "Geographentag." Since then Dr. Riebeck has continued his journey. Starting from Singapore, he is to follow the eastern coast of the Asiatic continent, then to cross over to Australia and New Zealand, and finally to return to Europe next summer by way of San Francisco and Panama.

To the Berlin Geographical Society the other evening, Major von Mechow gave some account of his explorations during the last year or two in the region of the Coango. Leaving Berlin in September, 1878, accompanied by a ship's carpenter and a gardener, Major von Mechow arrived at Dundo on the Coanza in the following January; but, owing to various difficulties, it was the beginning of 1880 before he could start northwards into the interior at the head of 115 native carriers. Crossing and re-crossing the Cambo, and passing through various powerful and hospitable tribes, the German traveller, after a thirty-seven days' march, at last reached the Coango on July 19, 1880, and, under the guidance of the great chief Tembo Aluma, visited the magnificent Succambundu waterfall, which he named after the Emperor William. After canoeing it on the Coango for twenty-five days, Major von Mechow made a detour to pay his respects to the great Muene Putu Kassongo, by whom he was received in great state, and returning on September 19 to the river, he followed it to longitude 5 deg. 5 min., from which point the fear of his followers of the neighbouring cannibals compelled him to return. In forty-five days he again reached the abode of Kassongo, where he stayed some time, and at last arrived on February 20, 1881, at Malange, where he met his returning countryman, Dr. Buchner, as well as Herr Pogge and Lieut. Wissmann, who were both starting on a similar tour of exploration.

A GERMAN edition of Amici's "Morocco" has been published by Hartleben of Vienna. Herr von Schweiger-Lerchenfeld is the editor, and has to a considerable extent remodelled the work, adding interesting ethnographical and historical notes, and omitting passages and references which in the original work can only interest Italian readers, on account of their purely private and local character. Its scientific value is also considerably increased. Two new chapters have been added, one on Southern Morocco, the other on the war between Spain and Morocco in 1860, and these are not the least attractive ones in the book, quite apart from the geological interest attaching to

the first one. Herr von Schweiger-Lerchenfeld describe Rohlf's journeys in 1862 and 1864, the Oases of Tafilet and Boanan, the Draa district, the extreme south-western coast districts, the Wadi Sus valley, the journeys from Ktaua to the southern frontier, and from Tafilet to Igli, the Saura river, Beni Abbes and Karsas, the journey to the oasis of Tuat, In Salah, and numerous other subjects of geographical interest. His descriptions are graphic and full.

News of the Danish Arctic Expedition has been received at Copenhagen, Tuesday night, up to September 22. The Expedition was then ice-bound near Mistni Island; but it was confidently hoped that the vessel would get free, and in any case there appeared then to be no danger.

At its last sitting, the Geographical Society of Hamburg resolved to despatch a new expedition into the centre of East Africa. Its chief will be Dr. Fischer, who was one of Denhardt's companions in 1872, and remained behind at Zanzibar when his leader returned home. Dr. Fischer applied this summer to the Hamburg Geographical Society for means to enable him to cross the Snow Mountains, and then penetrate to the north of the Gallas regions, and as the enterprise seemed likely to favour the development of certain branches of the Hamburg trade, a sum of 15,200 marks was immediately subscribed for its furtherance.

THE "Thüringisch-Sächsische Verein für Erdkunde" held a general meeting at Kösen on October 1. Prof. Brauns (Halle) spoke on his travels in the mountain districts of Southern Japan; Dr. Nicolai (Jena) on the land and people between the Ruhr and the Wupper; Dr. Assmann (Magdeburg) on meteorological observations made on the summit of the Brocken.

#### UNIVERSITY AND EDUCATIONAL INTELLIGENCE

OXFORD.—Although the new Statutes have come into force, regulating the courses given by the various teachers of science, and bringing the college tutors more or less under the control of the central authority of the Science Board, as yet no steps have been taken to form any of the new Boards of Faculties, and for this term at least lecturers only consult their own convenience and the wants of their particular pupils. In the Physical Department of the Museum, Prof. Clifton gives a course on "The Electricity developed when Different Substances are in Contact with one another;" Prof. Price gives a course on Optics; Mr. Stocker a course on Elementary Mechanics; and Mr. Heaton will form a class for the study of problems in elementary mechanics and physics.

At Christ Church Mr. Baynes gives a course of lectures on Electrical Testing, to be followed by a course of practical instruction in electrical and magnetic measurements.

At Balliol Mr. Dixon gives a course of lectures on Elementary Physics.

In the Chemical Department of the Museum Prof. Odling gives a course of lectures on Cyanogen and its Compounds. Mr. Fisher lectures on Inorganic, and Dr. Watts on Organic Chemistry. Mr. F. D. Brown will form a class for practical instruction in Organic Chemistry.

At Christ Church, Mr. Vernon Harcourt lectures and forms a class for practical work in Quantitative Analysis.

In the Biological Department of the Museum, Prof. Moseley continues his course on Comparative Anatomy. Each lecture is followed by a practical course in illustration of the lecture.

Mr. S. J. Hickson will lecture on some recent improvements in histological methods, each lecture to be followed by practical instruction. Mr. Morgan gives a course on the Teeth of Vertebrata, and Mr. Barclay Thompson a course on the Vertebrate and Invertebrate Skeleton.

The Scholarship in Natural Science at Trinity College has been awarded to Mr. David H. Nagel, of St. Andrew's University; *proxime accessit*, Mr. H. T. O. Minty, of the Royal College of Science, Dublin. The following gentlemen have been named as distinguishing themselves in the examination:—Mr. J. Waddell, of Dalhousie College, Nova Scotia; Mr. F. L. Overend, of Manchester Grammar School; and Mr. T. H. J. Watts, of Llandoverly School.

CAMBRIDGE.—To supply the place of a Demonstrator which the late Prof. Balfour had asked for, and to carry on his work during the current year, the Council of the Cam-

bridge Senate have recommended that 300*l.* be placed at the disposal of the Board of Biological and Geological Studies for the year. Trinity College has appointed Mr. A. Sedgwick, who was lately Mr. Balfour's Demonstrator, and had the sole charge of the classes for two terms during Mr. Balfour's illness this year, to a lectureship for the current year, on conditions similar to those under which Mr. Balfour conducted his classes before his appointment to the professorship.

The following science lectures have been announced:—Professor Cayley, on the Abelian and Theta Functions; Professor Lewis, on Mineralogy and Crystallography; Mr. Muir, Caius College, on the Metals, and General Principles of Chemistry; Mr. Lea, on Chemical Physiology; Dr. Michael Foster, on Elementary Physiology; Mr. Langley, on Physiology and Histology, with practical work; these lectures will deal with protoplasm, the cell theory, theory of contraction, blood corpuscles, muscle, ciliated cells, nerve cells, endings of nerves, and the general physiology of nerve and muscle.

Mr. A. Sedgwick will give an elementary and an advanced course on the Invertebrata, with practical work. The advanced course will be given in conjunction with Mr. W. H. Caldwell, of Caius College, and will extend over three terms.

Prof. Newton is lecturing on the Evidence of Evolution in the Animal Kingdom.

Prof. Humphry is lecturing on Osteology, and holds advanced classes in Anatomy and Physiology.

Messrs. A. G. Greenhill and R. R. Webb are appointed Moderators for the ensuing year.

Mr. W. N. Shaw (Emmanuel College) is appointed a member of the Board of Physics and Chemistry, and Messrs. A. Sedgwick and E. Hill are added to the Board of Biology and Geology.

Mr. R. Etheridge, F.R.S., and the Rev. E. Hill, are appointed adjudicators for the Sedgwick Prize.

The Medical Examiners for the year are, 1st M.B., Messrs. P. T. Main, W. Garnett, and S. H. Vines; 2nd M.B., Drs. Watney, Shuter, and A. M. Marshall; 3rd M.B., Drs. Reginald Thompson, Galabin, and Handfield Jones. Examiners in Surgery, Messrs. Luther, Holden, and T. Brayant; Assessor to the Regius Professor of Physic, Dr. Cheadle.

Messrs. R. S. Heath, Second Wrangler 1881, and A. E. Steinthal, Third Wrangler 1881, have been elected to Fellowships at Trinity College.

#### SCIENTIFIC SERIALS

*Zeitschrift für wissenschaftliche Zoologie*. Bd. 37, Heft i., August, 1882, contains:—On the development of *Asterina gibbosa*, Forbes, by Prof. Dr. Hubert Ludwig (with woodcuts and plates 1 to 8).—On *Marginella glabella*, L., and on the Pseudo-marginellidæ, by Justus Carrière (plate 9).—On the lateral canal system in *Cottus gobio*, by Dr. E. Bodenstein (plate 10).—On the coloration of the nestlings of the genus *Electus* (Wagl.), with a list appended of seventy-one papers on this somewhat vexed question, by A. B. Meyer.

*Verhandlungen der k.k. zool.-botan. Gesellschaft in Wien*, Bd. xxxii. Pt. 1 (January to June, 1882), contains, in addition to the proceedings of the Society, the following memoirs:—Zoology. By Dr. R. Bergh, contribution to a knowledge of the Aeolididæ, vii. (plate i.-vi.).—Dr. F. Brauer, on *Sympycna padisca*, a justification of this as a new species.—Dr. R. Drasche, a revision of the types of Diesing and Molin in the Nematode collection of the Society (plates 7 to 9).—On Oxycoyria, a new genus of Synascidian (plate 13).—Helminthological notes (plate 12).—Count Keyserling, on new American spiders (plate 15).—Dr. Löw, the characteristics of the genera Aphalara and Rhinocola (plate 11). A revision of the palaearctic Psyllidæ, and on a new species of coccus (*Xylococcus filiferus*) (plate 16).—A. v. Pelzeln, on the export of birds from Borneo.—A. Wimmer, on some adriatic shells.—Botany: Dr. G. Beck. New Austrian plants (plate 14).—W. Vos, material towards a list of the fungi of Krains.—Dr. F. Arnold, in memory of F. X. Freiherr v. Wulfen, born November 5, 1728, died March 16, 1805.

*Revue internationale des Sciences biologiques*, August 15, 1882, contains—On modern Hylozoism, by Jules Soury.—On the structure and the movement of protoplasm in vegetable cells, by H. Frommann (in continuation).—On psychology and the labours of Broca, by M. Zaborowski.